



# Data Management (or How Do I Handle All of That Stuff?)

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Software Process Improvement (SPI) Project



#### **Purpose and Objectives**



- Purpose: Introduce the audience to the concept of Data Management and how it should be applied on each project
- Objective After this session you should understand:
  - The objectives of Data Management
  - What a Data Management List (DML) is and what it does for you
  - What tools are available to help you set up a repository for your artifacts



#### First – Some Definitions



- Data Management the organization and control of data generated in the course of a project
- Data artifacts that are products or biproducts of the processes applied in accomplishing the project work
  - Example artifacts include draft documents, final documents, analyses, reports, presentations, emails, meeting minutes



### It's February 2009 ... Do You Know Where Your Data Is?



Usually programs/projects/teams have all the data they need to operate, so what's the problem?

- Data is somewhere, but it's not necessarily organized, maintained ("managed"), or accessible
- Often, only deliverable data controlled by formal Configuration Management (CM) is organized and readily accessible
- Other data is usually left to the Team lead or project members to organize
  - It's on any number of platforms (including local drives on PCs and laptops)
  - It's in any number of formats
  - It's not accessible to all team members
  - It can be lost if the person who put it there leaves
- Projects need Data Management (DM) to ensure data availability



#### **How is DM Different from CM?**



- CM applies only to configuration-controlled items Documents and/or operational source code that are CCB controlled
- DM applies to all data items, not just those formally controlled by a CCB
  - CCB-controlled items documents or other information requiring formal level of approval, such as CCB
  - Version-controlled items documents, information, or software that receive version numbers as they change, but that do not require CCB approval
  - Stored items all data generated in the course of doing business that is not CCB-controlled or versioncontrolled (such as meeting minutes, monthly reports, metrics, notes, draft reviews, and emails)



#### **Data Management Objectives**



- To make most material available to project members (people like to know where information resides)
- To describe what level of control is needed for each item
- To direct where records should be stored and to organize the repository
- To facilitate monitoring of items to ensure data is kept as planned



#### **Organizing Your Data**



- A Data Management List (DML) is a list of all project data (artifacts) that are to be kept in an organized fashion
- A level of control is assigned to each artifact in the DML
- The location of each group of DML artifacts is identified for easy access
- An "owner" of each group of DML artifacts is identified
- Data Management needs to be monitored throughout the project to ensure that expected artifacts are being stored as planned



#### The DML is Consistent With NASA Policy



■ If you completed the SATERN class, "NASA Records Management for Everyone", you should recognize this:

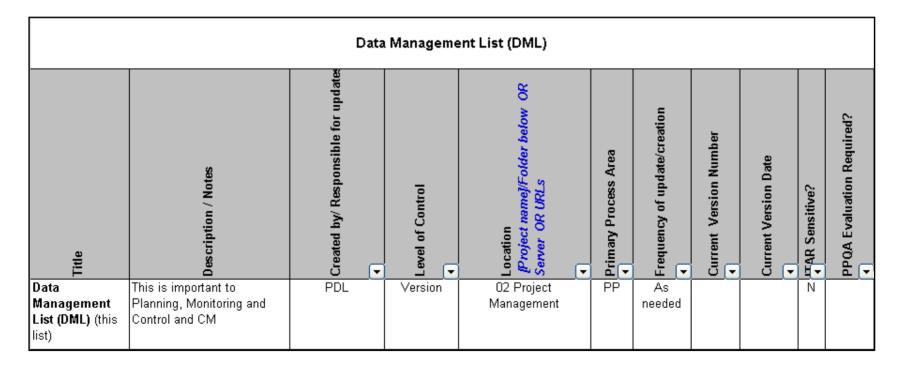
ORGANIZATIONAL FILE PLAN AND RECORDS LIST												
Organizational Code:		Completed by:		Approved by:		Date:						
Organization	nal Name:	Re	cords Approval:	Date:								
FILE PLAN CODE	TITLE OF RECORD	RESPONSIBLE FOR MAINTAINING	FILE LOCATION	PROCESS	RETENTION SCHEDULE	RETENTION DURATION						
NASA C-278 (Rev. 4-2006) PAGE <u>0</u> OF <u>0</u>												



# Our DML Is Similar to a File Plan and Records List



■ The DML has different fields from the "File Plan and Records List", but it accomplishes similar objectives





#### So What Does the DML Do for You?



- The Data Management Tool \* ...
  - Provides a standard template for a list of the materials generated by a software project
  - Indicates storage location, how items are controlled, and who controls them
  - Includes monitoring fields and a monitoring log to help ensure the expected data items are being collected
  - Includes a time-phased checklist to ensure adequate coverage of monitoring
- You can customized it for your project ... contact the SPI for information on customizing the tool

\* http://software.gsfc.nasa.gov/tools.cfm



#### **A DML Example**

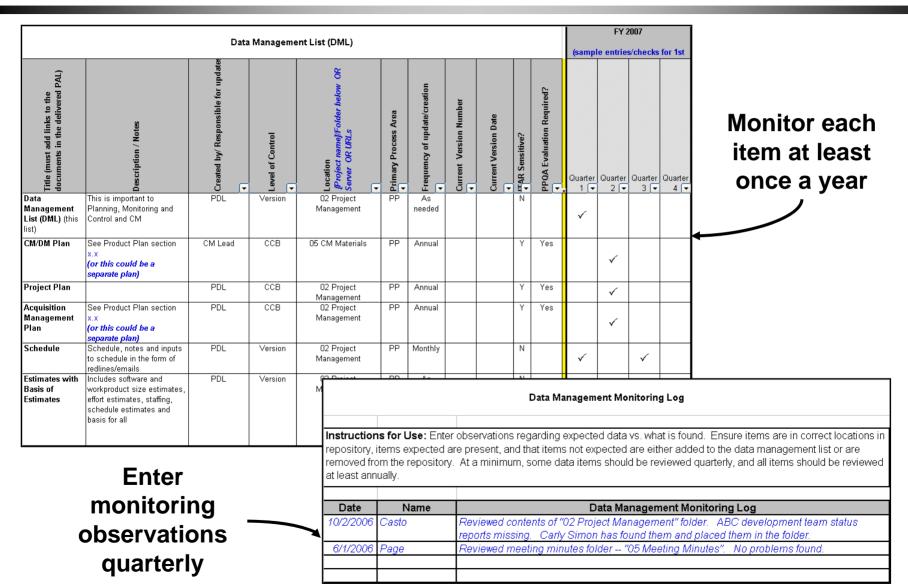


Data Management List (DML)									F	Y 2007	FY 2008					
Title	Description / Notes	Created by/ Responsible for updated	Level of Control	Location	Primary Process Area	Frequency of update/creation	Current Version Number	Current Version Date	HAR Sensitive?	PPQA Evaluation Required?	11 0 H 1 8 0 0 0	Quarter		Quarter 2 🔻	Quarter 3 🔻	
Data Management List (DML) (this list)	This is important to Planning, Monitoring and Control and CM	PDL	Version	Management and Administration> Documents - Project Plans>Configuration and Data Management Plan	PP	As needed	1	2/6/2008	N				✓	✓		
CM/DM Plan	See Product Plan section 6.0	CM Lead	CCB	Management and Administration> Documents - Project Plans>Configuration and Data Management Plan	PP	Annual	0.02	9/30/2007	Υ	Yes			<b>~</b>	<b>√</b>		
Product Plan		PDL	CCB	Management and Administration> Documents - Project Plans>Project Management Plan	PP	Annual	1	10/26/2007	Υ	Yes			<b>√</b>	✓		
Acquisition Management Plan	See Product Plan section 4.0	PDL	CCB	Management and Administration>Planning and Monitoring>Documents	PP	Annual	0.02	9/30/2007	Υ	Yes			<b>√</b>	✓		
Schedule	Schedule, notes and inputs to schedule in the form of redlines/emails	PDL	Version	Management and Administration>Planning and Monitoring>Schedules	PP	Monthly		2/1/2008	N			<b>~</b>	<b>√</b>	✓		
Estimates with Basis of Estimates	Includes software and workproduct size estimates, effort estimates, staffing, schedule estimates and basis for all	PDL	Version	PDL Desktop	PP	As needed			N							
Processes	Includes process for both mgmt and technical work. See Product Plan section x.x for references.	ISD Division CCB	CCB	http://software.gsfc.nasa.gow/p rocess.cfm	PP	As needed			N			<b>√</b>				



#### **Data Management Tool Worksheets**







#### What Should Be in Your DML?



- Include artifacts from each of the following process areas:
  - Project Planning
  - Project Monitoring and Control
  - Risk Management
  - Requirements Management
  - Measurement and Analysis
  - Configuration Management
  - Process and Product Quality Assurance
  - Acquisition Management
  - Development and Integration
  - Verification and Validation



#### Types of Data to Include in Your DML



- Records of meetings and events where decisions are likely to be made
  - Minutes, actions, attendance, agendas,...
- Records of Planning and Replanning
  - BOE (reviews and approvals), plans and replans, Branch Status Review (BSR) records, ...
- Records of Tracking Progress
  - Progress measures, progress review records, action items,...
- Records of 'Risk Management'
  - Defining, reporting, mitigating, ...
- Records from Contractor Management Activities
  - Contractor reports, surveillance reports, delivery records, invoices, ....
- Others
  - Requirements, inspections, change records, key e-mails,...

To enable the management of all of these artifacts, you need a *Data Repository* 



### **Example Development Project DM Repository Structure**



Establishing a repository helps organize required records; for example, a network server may have the following directories:

- Project Management
  - Planning
  - Status
  - Meeting minutes
- Project Support
  - Measurement
  - Configuration Management
  - Quality Assurance
  - Action Items
- System Engineering
  - Requirements

- Development
  - Technical packages
  - Inspection records
  - Review packages
- Products
  - Plans
  - Documents
  - Milestone reviews
- Test
  - Plans
  - Results
  - Discrepancies

Consider developing such a structure for your project.

Use the Web Repository if you have no server.



## Example Acquisition Project DM Repository Structure



### Organize acquisition artifacts on a server for non-sensitive or in notebooks or a personal PC for sensitive materials

- Acquisition Management
  - Plans
  - Your Status reports
  - Meeting minutes
  - QA records
  - Surveillance records
  - Action Items
- Contract Materials
  - Letter of Delegation
  - Copy of contract and changes
  - Invoices and financial records
- System Engineering
  - Requirements

- Development review items
  - Contractor intermediate products
  - Contractor Review packages
- Deliverables
  - Delivery letters
  - Final products
  - Acceptance Test results
- Close-out records
  - GFE inventory and records
  - New technology reports
  - Final vouchers



#### **Creating a Repository**



- Use a server for your repository if possible so the project has access to the data
  - Keep sensitive information in a protected area or maintain it on the Team lead computer
- If you have a server, set up an organized set of folders to hold your artifacts
- If you don't have a server, there is a Web Repository Tool available for free
  - It provides server space on a per-project basis
  - It allows you to identify who has access
  - It allows you to set up your own organization structure and add and delete as desired
  - Go to http://software.gsfc.nasa.gov/tools.cfm and look for "Repository (web-based)"
  - Contact point is Chris Durachka, Code 585, Chris.Durachka@nasa.gov



#### **Summary**



- Plan for data management as you organize your project
- Identify the artifacts that should be maintained as your project proceeds (and let people know)
- Document the artifacts in a DML, identifying the location where artifacts are to be stored
- Set up a project repository where artifacts can be accessed by all team members, but keep sensitive data protected
- Verify that the records are being stored in accordance with your DML
- ... and remember to look for tools at http://software.gsfc.nasa.gov/tools.cfm





# Questions?



#### **Acronyms**



- BOE Basis of Estimate
- BSR Branch Status Review
- CCB Configuration Control Board
- CM Configuration Management
- DM Data Management
- **DML Data Management List**
- GFE Government Furnished Equipment
- PDL Product Development Lead
- PPQA Process and Product Quality Assurance
- QA Quality Assurance
- SATERN System for Administration, Training, and Educational Resources
- SPI Software Process Improvement